

### ABSTRACT OF THE DISCLOSURE

The present invention relates to a new method of digital FM demodulator that using the delay lines as timing reference and the concept of delta-sigma analog-to-digital converter to implement the function of time-to-digital conversion; said FM demodulator comprising delay lines, multiplexer, phase detector, charge pump circuit, quantizer and digital integrator. The modulation signal in intermediate frequency segment will pass through delay lines around one cycle time and compare with original input modulation signal, and the compared pulse converted into voltage and store in capacitor by way of charge pump circuit. The quantized voltage has been accumulated, then re-select a new delayed output signal to compare its phase with input signal. This system is similar to PLL, is a feedback system. This quantized digital signal again pass through a low-pass filter to filter out high frequency quantized noise to get the original digital modulation signal.

This invention combines the function of demodulation and analog-to-digital conversion.